

United States Patent [19]

Arai et al.

[11] Patent Number: 4,921,705

[45] Date of Patent: May 1, 1990

[54] LIPID POWDER HAVING CROSS-LINKED COATING THEREON AND PROCESS FOR PREPARING SAME

[75] Inventors: Motoharu Arai; Masatsugu Ito, both of Tokyo, Japan

[73] Assignee: Nippon Oil and Fats Co., Ltd., Tokyo, Japan

[21] Appl. No.: 216,887

[22] Filed: Jul. 8, 1988

[30] Foreign Application Priority Data

Jul. 14, 1987 [JP] Japan 62-173825

[51] Int. Cl.⁵ A61K 9/48

[52] U.S. Cl. 424/450; 424/491; 424/498; 428/402; 428/403

[58] Field of Search 424/491, 492, 493, 494, 424/498, 450; 514/2, 21; 428/402, 403

[56] References Cited

U.S. PATENT DOCUMENTS

3,549,555 12/1970 Hiestand et al. 424/492
3,886,084 5/1975 Vassiliades 424/494
3,956,172 5/1976 Sacki et al. 424/492
4,376,113 3/1983 Suglia et al. 424/492

4,402,856 9/1983 Schnoring et al. 424/492
4,492,714 1/1985 Cooper et al. 426/602
4,515,769 5/1985 Merritt et al. 424/49

Primary Examiner—Jacqueline M. Stone

Assistant Examiner—Jean Witz

Attorney, Agent, or Firm—Majestic, Parsons, Siebert & Hsue

[57] ABSTRACT

A lipid powder having a cross-linked coating thereon comprises a core lipid powder and a water-soluble coating agent coating the core lipid powder. The water-soluble coating agent contains cross-linked protein. A process for preparing lipid powders each having a cross-linked coating thereon comprises the steps of emulsifying lipid and a water-soluble coating agent containing protein to obtain an emulsion, adding a cross-linking agent for the protein to the emulsion to thereby cross-link the protein, atomizing and drying the emulsion containing the cross-linked protein to terminate the cross-linking reaction and to obtain lipid powders each coated with the water-soluble coating agent, and cooling the coated lipid powders.

11 Claims, No Drawings